

PROFORMA FOR NEW COURSE

1.	Title of the Course	Functional Data Analysis
2.	Course Number	MA6033
3.	Status of the Course	Elective
4.	Structure of Credits	3-0-0-3
5.	Offered To	PG
6.	New Course/Modification to	New
7.	To be Offered by	Department of Mathematics and Statistics
8.	To take effect from	July 2020
9.	Prerequisite	CoT
10.	Whether approved by the Department	Yes
11.	Course Objective: To introduce and explore basic functional data. To impart knowledge of how functional data arises. To develop statistical and mathematical techniques to deal with smooth functional data having systematic patterns.	
12.	Course Content: Exploring functional data, phase plane plot, representing function by basis function and some useful basis, smoothing functional data by least squares and weighted least squares technique, choosing the number of basis functions, smoothing by roughness penalty, fitting functions, registration, principal component analysis, canonical correlation, and discriminant analysis, functional response and multivariate and functional covariates, functional linear models with scalar and functional response.	
13.	Text book(s): 1. Bosq D, <i>Linear Processes in Function Spaces: Theory and Applications</i> , 1st Edition, Springer (2000). 2. Ramsay J O and Silverman B W, <i>Functional Data Analysis</i> , 2nd Edition, Springer (2005).	
14.	Reference(s): 1. Kokoszka P and Reimherr M, <i>Introduction to Functional Data Analysis</i> , 1st Edition, CRC Press (2017). 2. Ramsay J O, Hooker G and Graves S, <i>Functional data Analysis with R and Matlab</i> , 1st Edition, Springer (2009) 3. Ramsay J O and Silverman B W, <i>Applied Functional Data Analysis</i> , 1st Edition, Springer (2002). 4. Srivastava A and Klassen E P, <i>Functional and Shape Data Analysis</i> , 1st Edition, Springer (2016).	